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Meat Inspection and the Practising Veterinary Surgeon *

BY

By H. E. BYWATER
Stratford, London

Introduction

IT is as well that the practising veterinary surgeon, who may be called upon to advise on slaughtering and meat inspection, should have some knowledge of the legislation governing this aspect of public health.

The main enactment with regard to food inspection is the Food and Drugs Act 1955. This Act defines the authorities responsible for the enforcement of its provisions. Regarding meat inspection, these are the "food and drugs authorities," *i.e.* (*a*) The Common Council of the City of London, (*b*) The Council of every County or Metropolitan Borough, (*c*) The Council of every non-County Borough or Urban District having a population of 40,000 or upwards, and (*d*) for every other area within a County, the County Council. The Minister of Health may direct that a non-County Borough or Urban District having a population between 20,000 and 40,000, may be appointed the Food and Drugs Authority should it so wish, subject to approval by the County Council. It should be noted that the food and drugs authorities are not necessarily those which have the power to license slaughterhouses and knackers' yards, or to issue slaughtermen's licences.

Meat Inspectors

The Food and Drugs Authority may authorise officers to perform specific duties under the Act, including police officers in respect of sampling. The medical officer of health and the public health inspector, etc., are authorised officers for all purposes of the Act, but only 4 categories of persons are empowered to inspect meat. These are the medical officer of health, the public health inspector, a veterinary surgeon employed by the local authority for the purpose of food inspection, and anyone having qualification prescribed by Regulations of the Ministers of Agriculture, and of Health. No such Regulations have as yet been made so that, in effect, there are at present only three categories of inspectors qualified by the Act to examine and seize meat. The fourth category was inserted in the Act to allow the employment, if found desirable or necessary, of persons from the meat trade, etc., who were considered to be suitable for appointment as "detention officers." No doubt those having qualifications similar to those of Scottish detention officers would come within this class.

Power to Inspect

Meat inspection duties are performed under Article 9 of the Act which states that "An authorised officer of a council may at all reasonable times examine any food intended for human consumption which has been sold, or is offered or is exposed for sale, or in the possession of, or has been deposited with, or consigned to, any person for the purpose of sale or for the preparation of sale, and if it appears to him to be unfit for human consumption may seize it and remove it in order to have it dealt with by a Justice of the Peace." Elsewhere in the Act, food offered as a prize or reward, or by way of advertisement, etc., is deemed to have been offered "for sale."

In actual practice very little food is legally seized or condemned. The inspector having expressed an opinion as to the unfitness of the food, the owner or his agent normally surrenders it voluntarily, though usually without appreciation of the true legal position or the implications of his specific or implied consent. The inspector then makes the necessary arrangements for disposal of the food, or allows the owner to dispose of it so as to prevent its finding its way into the human diet. All allegedly unfit meat is normally stained with a dye before leaving the slaughterhouse in order to make it more easily identifiable. No proceedings can be taken against the owner or his

* A Paper read to the Western Counties Division of the B.V.A.

agent in connexion with the surrendered food, unless, of course, an attempt is made improperly to dispose of it.

Seizure and Condemnation by J.P.

If the owner or his agent refuses to surrender the food, or if the inspector is of the opinion that legal proceedings may ensue, he formally seizes it and informs the person in whose possession he found it that he intends to have it dealt with by a Justice of the Peace, who alone has the legal power to condemn unfit food. It is the common practice to refer to meat and other foods which have been rejected by an inspector as " condemned " and one often sees in official literature and reports this term used incorrectly. All food voluntarily surrendered is "rejected," not " condemned."

The inspector must inform those concerned of his intention to have the food dealt with by a Justice of the Peace, and the time and place where this will be done. Any person liable to prosecution, or dispossession of his property, has a right to be present, to be heard by the Justice, and to call witnesses. If the Justice decides that the food is unfit for human consumption, he has power to condemn it and order it to be destroyed or suitably disposed of. If, however, the Justice refuses to condemn, the local authority must compensate the owner for any depreciation in the value of the food resulting from its seizure and removal.

The wise inspector will, therefore, take measures to ensure that as little depreciation as possible occurs and, in the case of perishable foods such as meat, will hold them in cold store pending the date when the material will be brought before the Justice.

Before the Food and Drugs Act, 1938, an inspector could have any food he considered unsound immediately destroyed by the simple expedient of persuading a Justice of the Peace to agree—in private—upon the unsoundness. The owner could then be faced with a charge of exposing unfit meat for sale, and might well be convicted in the absence of any chance to have the food examined by a competent authority acting on his behalf.

Some Legal Cases

Bearing on the above, it may be of some interest to recall, and to comment upon, a case which was reported in THE VETERINARY RECORD of June 5th, 1954, and also another which appeared in our journal as recently as August 10th this year.

In the first case, a cow with an injured back was being fattened for grading but the veterinary surgeon in attendance advised that she should be sent to the Ministry of Food slaughterhouse as a casualty. After slaughter the sanitary inspector of the rural district council rejected the carcase and refused, at first, to allow it to be seen by the owner's veterinary surgeon. The position was not as clear cut as it would be to-day, since at the material time rationing of meat was in force and all slaughtering was undertaken by the Ministry who paid farmers on a graded live-weight basis irrespective of whether the meat was subsequently passed or rejected by the inspector, except in the case of emergency slaughter when payment was made only on meat passed for human consumption.

The veterinary surgeon contacted the British Veterinary Association who advised him that, in its opinion, the farmer remained the legal owner of the animal. If the owner refused to surrender the meat to the inspector, then he must formally seize it and have it dealt with by a Justice of the Peace in accordance with the provisions of the 1938 Act. The National Farmers' Union took the matter up, and in due course the owner's veterinary surgeon was given permission to examine the carcase. He advised the owner not to surrender it. Some argument, apparently, took place with the Clerk to the Council as to the necessity for formal condemnation by a J.P. but when, finally, the matter was referred to the Justice, the case was hurriedly called for the following morning, the owner being given about an hour's notice of the hearing. Obviously it was not possible to present a reasoned case in the time available, and the N.F.U. solicitor applied for an adjournment which was granted. Subsequently the magistrate, upon hearing the evidence of the sanitary inspector, the veterinary surgeon, and the Divisional Veterinary Officer of the Ministry, refused to condemn it—although by this time it had become decomposed through neglect to keep it in cold storage.

The carcase was then sent by the Ministry of Food to another locality, where it was voluntarily surrendered (by the Ministry). Neither they nor the Council appeared ready to compensate the farmer for his loss. The Council offered payment at " condemned meat " price (2½d. per lb.) but the farmer claimed he was entitled to the graded carcase value of 10½d. per lb. The parties being unable to come to terms, the Ministry of Housing and Local Government was asked to appoint an arbitrator but, after a lapse of 8 months during which time nothing had been done, the N.F.U. appealed to the Minister of Agriculture who referred the matter to the Minister of Food, that Ministry then agreed to pay the farmer the accepted price for a graded carcase.

The more recent case was not one taken under the Food and Drugs Act for condemnation of allegedly unfit meat, but was a civil action to recover damages for alleged neglect to exercise due care and proficiency in the performance of meat inspection.

The facts of the case were as follows :—

A farmer had a barren, dry, Friesian cow being fattened for slaughter. The cow sustained a fracture of the leg and was sent for emergency slaughter. It was slaughtered in the early evening, and, later on the same day, was examined by a veterinary surgeon in company with a veterinary student. Certain of the lymph nodes were incised and it was considered that, apart from the area around the fracture, the meat was fit for human consumption.

The next day, about lunch time, the public health inspector of the local Rural District Council examined the carcase and, without consulting anybody, slashed the sides so making the meat unsaleable for human food. The reason he subsequently gave for this action was that the meat was " wet and fevered." The following day the veterinary surgeon this time

accompanied by his partner found the meat well set, and in excellent condition, and quite fit for human food.

A case was brought by the owner against the Council on the grounds that the meat except that around the fracture had been fit for human food but had been made unfit by the inspector's action. Evidence was given by the two veterinary surgeons, the owner and the slaughterer. The public health inspector gave evidence to the contrary and inferred that the veterinary surgeons had made only a superficial examination. The Judge accepted the further evidence of the public inspector that he had himself cut the lymph nodes and that the veterinary surgeon had not done do. This point was mentioned in the summing up. The plaintiff had never anticipated that it would be disputed that the veterinary surgeons had incised the lymphatic nodes, and since his case had been presented, it was not possible to recall the veterinary surgeons and other witnesses to show that the incisions had been made before the public health inspector dealt with the carcase.

The plaintiff's contention was that the inspector had no right to mutilate the carcase before it had been formally condemned by a Justice of the Peace. The meat had been slashed before legal rejection. The public health inspector contended that this practice had been adopted by him in agreement with the butcher, who preferred to have rejected meat slashed rather than stain it with a dye.

The Judge, in finding for the defendants, said that the inspector was acting quite properly in slashing the meat without first having it legally condemned since he considered that he was following an accepted practice which had grown up between him and the slaughterer. No appeal was possible, and the only action left to the plaintiff was to decide whether he would allege perjury on the part of the inspector and ask for the case to be re-opened upon that ground.

Veterinary Participation in Meat Inspection

Since there is evidence of reluctance to employ members of the profession in the local authority meat inspection service, the position might be improved if more practising veterinary surgeons made themselves proficient in the examination of meat and familiar with the appropriate legislation.

There are those in this audience well qualified to act as meat inspectors : but there may be others who would like to revise their knowledge of the subject. They might find interesting reading in some of the latter chapters of F. Drabble's text-book on meat inspection. This book is written primarily for the Australian meat inspector, but the basic principles are applicable everywhere. Those wishing for a more detailed and erudite source of information will find no better work of reference than Horace Thornton's treatise.

Memos. 62/Foods and 3/Meat

In order to obtain, as nearly as possible, a uniform standard of meat inspection throughout the country, the Ministry of Health, in 1923, issued recommendations in the form of Memorandum 62/Foods. This was replaced in 1952 by Memorandum 3/Meat which was issued by the then Ministry of Food, and is obtainable from H.M. Stationery Office, price 9d. It must be stressed that these memoranda were—and are—merely recommendations, having no statutory force comparable with the code of meat inspection in Scotland which is detailed in an Act of Parliament and lays down an obligatory procedure with regard to the judgments which are to be maintained by meat inspectors in Scotland—deviations from which are breaches of the law.

There is no such legal obligation imposed upon the English and Welsh inspector to adhere strictly to the code of inspection recommended in Memo. 3/Meat, but undoubtedly any deviation from the recommendations would render the meat inspector liable to criticism and the courts would probably rule that any decision made contrary to the memorandum was unacceptable. Memo 3/Meat contains a list of diseases and conditions which should be regarded as rendering meat unfit for human consumption, together with the detailed procedure to be adopted in the examination and standard of judgment in cases of certain diseases such as tuberculosis, *Cysticercus bovis* infestation, caseous lymphadenitis and similar conditions. Memo. 62/Foods advised a more severe judgment in the case of tuberculosis than that imposed by the Scottish law, which aims at passing as much meat as possible consistent with public safety. Memo. 3/Meat more nearly approximates to the Scottish code. It is of interest to reflect that although tuberculosis in cattle is generally much lower in its incidence than in 1923, more meat from tuberculous carcases can now be passed than when the incidence was very considerably higher.

One might perhaps argue that easing the standard in favour of the producer and butcher was not in the public interest—more especially since the resistance of man to bovine tuberculosis infection might well have declined with the lessening opportunity to acquire immunity from tuberculous milk. Be that as it may, the work of Ranke & Nieberle would appear to support the contention that a great deal of perfectly safe meat was—and still is—rejected as unfit. It also draws attention to the fact that it is not the extent of the lesions within the carcase and its organs which are of prime importance, but the type of the lesions. Lesions which are small in extent but active and acute are evidence of a tuberculous bacteraemia, whereas chronic inactive lesions, even if more widespread, are of less consequence, the actual meat being free of *Mycobacteria tuberculosis*. The carcase with a mass of " grapes " on the pleura may be potentially far less dangerous than one where there is a small area of actively progressing infection. The veterinary surgeon should obviously be better able to assess the type and significance of such lesions, and the risk to be attached to eating the meat from a carcase with such lesions, than one who has not had adequate training in veterinary pathology and bacteriology.

Refresher Courses

It might be possible for the Bristol University Veterinary School which has already a part-time lecturer in meat inspection to arrange short refresher courses in meat inspection, in conjunction, possibly,

with practising veterinary surgeons in the area who have had experience in routine meat inspection. In any case, a valuable start could be made by those interested in the subject if they took all available opportunities to visit slaughterhouses and make themselves familiar with normal healthy carcases and offals. It is of the utmost importance to know instinctively the appearance of various types of healthy carcases and offals before attempting to go too deeply into abnormal and diseased processes.

Reverting to legislation, the Public Health (Meat) Regulations 1924 legally presumed to have been made under the Food and Drugs Act 1955—require that notice of intended slaughter shall be given to local authorities 3 hours prior to slaughter, and that the meat shall be retained for inspection for a period of 3 hours after slaughter or 6 hours after the giving of notice of intended slaughter, unless notice is given, and accepted, of regular days and hours of slaughtering, in which case the meat may be removed from the slaughterhouse after completion of the work. In the case of emergency slaughter, it is sufficient to give notice of the fact as soon as reasonably possible. Where notice of slaughter has been given and the expiry time is after 7 p.m., the carcase must be retained for inspection until 7 a.m. on the following day. The 3 hours during which it is required that the carcases shall be retained for inspection does not apply in the case of sheep.

Where on slaughter it appears that any part of the carcase or organs is, or may be, diseased or unsound the person on whose behalf the animal was slaughtered shall forthwith give notice of the fact to the local authority.

One should, however, not necessarily give notice of suspected disease in a carcase unless this would be obvious to the owner or slaughterer. The owner is not required to incise lymph nodes or make other detailed inspection in search of disease and, if he does so, then he may be accused of " obstruction " or of attempting to conceal signs of disease. On the other hand, it would be as well that he took all reasonable measures to ascertain that the meat was fit for human food before removing it from the slaughterhouse if, after the period of detention for inspection was passed, the inspector had not attended. The onus is always on the owner to offer sound and disease-free food for human consumption and he can be proceeded against even if he attempts to dispose of unsound food which has previously been passed by an inspector —although if he could produce evidence of the food having been so passed it is unlikely a court would convict. Obviously it is very desirable that all meat which has been inspected and passed should bear a stamp or other notification of the fact. Local authority inspectors, however, are not permitted to stamp inspected meat unless the practice has been sanctioned by the Ministry after being satisfied that suitable staff exist for the purpose of inspection.

Emergency Slaughter

Where an animal is slaughtered by reason of accidental injury and the place of slaughtering is unsuitable for the retention of the carcase, this and the organs may be removed to some convenient place provided notice is given to the authority in whose district the carcase is lodged—in lieu of the local authority of the actual place of slaughter.

Since emergency slaughter always raises a grave suspicion of disease or unsoundness in the mind of the meat inspector, it is important that every care should be taken not to increase this suspicion by failure to comply with the Regulations or by any other means. It is better to allow the inspector some latitude rather than abide strictly by the time limits.

Veterinary Certificate for Emergency Slaughter Drugs

Practising veterinary surgeons who advise owners to send animals for emergency slaughter should be acquainted with the procedure recommended in Memo. 3/Meat. This they should adopt in all cases. The Memo. states no undressed bovine or porcine carcase should be admitted into a slaughterhouse unless it is accompanied by a certificate given by a veterinary surgeon stating the reason for the slaughter of the animal and particulars of any drugs which to his knowledge had been administered to the animal and which might affect the carcase. Such drugs as turpentine, chloral hydrate, linseed oil, carbolic acid, creosote, ether, chloroform, asafoetida, nitrous spirits of ether, aromatic spirits of ammonia, camphor, aniseed and essential oils are all liable to give odour to meat. Pessaries based on iodoform or such dressings as BIPP may impart a most marked and objectionable odour to the meat. In this connexion it should be mentioned that cooking increases any smell in meat. Aloes, magnesium sulphate, the bromides and even treacle are best not given to animals likely to require emergency slaughter.

Undressed carcases of sheep or lambs may be admitted to a slaughterhouse without such a veterinary certificate if accompanied by a written declaration, given by the owner or person in charge of the animal at the time of its death, stating the reason for the slaughter of the animal, that it was not being treated by a veterinary surgeon, and giving particulars of any drugs or medicines recently administered to the live animal.

No dressed carcase may be admitted to a slaughterhouse, unless either (*a*) the carcase (with or without its organs or viscera) is accompanied by a certificate given by an authorised officer (*i.e.* a local authority meat inspector) certifying that the carcase and its organs and viscera have been inspected and passed fit for human consumption, or (*b*) the carcase is accompanied by its internal organs and viscera (other than the intestines) and by a certificate given by a veterinary surgeon stating the reason for slaughter and particulars of any drugs which might affect the carcase which to his knowledge had been administered to the live animal.

Export Certificates

Some slaughterhouse owners, where the local authority cannot provide a meat inspection service to

their satisfaction, pay the salaries of inspectors who are formally appointed as local authority officers for the purpose of meat inspection. This practice is adopted by certain of the large bacon factories. Such arrangements may be necessary to comply with the regulations of foreign countries wishing to import meat or meat products from this country, who demand veterinary certificates to accompany the exports. For many years certain practising veterinary surgeons have acted as private meat inspectors issuing such export certificates. Frequently they inspect meat which has already been inspected and passed by the local authority. Foreign countries will not usually accept certificates unless the person who signs them has been nominated for the purpose by the Ministry of Agriculture, and who forward copies of the signatures of the nominated veterinary surgeons to the countries concerned.

Humane Slaughtering

The Slaughter of Animals Act, and its Scottish counterpart, are designed to ensure humane slaughtering conditions in British slaughterhouses and knackers' yards. The original Act and its Amendments, together with the Slaughter of Animals (Prevention of Cruelty) Regulations, require that all animals shall be humanely stunned prior to slaughter by means of a mechanical stunning instrument, except those slaughtered by Jewish or Mohammedan ritual. In these rituals, an approved casting pen must now be used for adult cattle, but the animals are not required to be rendered unconscious prior to slaughter. Calves and sheep are either laid on a " crutch " or cradle, or suspended by the hind legs whilst the throat is slit. In Gentile slaughtering, cattle are usually stunned by means of a captive-bolt pistol, and less commonly by a loose bullet instrument, although there is now available an electric stunning apparatus for adult cattle which may well be used in Britain in the future. This apparatus, the Elther stunner, is in daily use on the Continent of Europe. Sheep and calves are stunned either with the captive-bolt pistol or the electric tongs, whilst pigs are normally stunned by electrical methods although the captive-bolt pistol is still used in some small slaughtering centres where the tongs are not available. In U.S.A. slaughterhouses, pigs are now being rendered unconscious by carbon dioxide, and consideration is being given to making this and similar methods permissible in Great Britain. I understand it is already legal in Northern Ireland.

A veterinary surgeon may kill any animal almost wherever he chooses, provided he adopts reasonably humane measures and holds a firearms certificate if he uses a gun or captive-bolt pistol. He cannot, however, legally kill an animal within the precincts of a slaughterhouse or knackers' yard unless he is a licensed slaughterman.

No fee for a firearms certificate is chargeable to a veterinary surgeon or other person who owns a humane killer for use in his profession or trade. This is not always appreciated by some police officers.

The Slaughter of Animals Act only applies to animals killed in licensed premises, and it is, therefore, permissible outside licensed premises to use any method of slaughtering one may care to adopt provided due humanity is practised. An exception is the case of pigs over 12 weeks old, which are now protected by the Slaughter of Animals (Pigs) Act 1953. Such pigs can only legally be slaughtered after stunning with a mechanically operated instrument irrespective of the place of slaughter. R.S.P.C.A. inspectors have been instructed to assist the public by the loan of humane killers for the occasional stunning of home-killed pigs. A person killing a pig for diagnostic or research purposes is exempt from the provisions of this Act.

Slaughterhouse Policy

The policy of successive Governments with regard to slaughterhouses has been vacillating. The original ideal of concentration of slaughter into a few large regional abattoirs has given place to one of " moderate concentration " and we are now in an interim period during which the situation is being allowed to " simmer " in order to allow of developments within the trade itself. Licences for established slaughtering premises will be allowed to continue subject only to the warning that, in the not too distant future, the Ministry of Agriculture, Fisheries and Food intend to act on the lines laid down in the recent White Paper on slaughterhouses and to seek legislative powers in this connexion.

Local authorities will individually or collectively be required to prepare and submit to the Ministry slaughterhouse reports showing existing slaughtering facilities reaching the required standard, those which are expected to be improved so as to reach the new standards, additional slaughtering facilities expected to be provided, and the date by which the authority considers that adequate slaughtering facilities will be available in their district. Interested parties will be given an opportunity to make representations to the Minister on these reports.

Until the " slaughterhouse report " is submitted there will be a period in which traders will be free to apply for and develop slaughtering facilities subject only to compliance with town planning requirements and to regulations governing standards of construction, layout, etc.

Whereas formerly a local authority could refuse to issue, or renew, a slaughterhouse licence on general grounds, refusal to issue—or renew an existing licence—provided the buildings are structurally satisfactory can now only be done on town planning grounds which, in the case of refusal to renew an existing licence, may involve the local authority in the liability to pay compensation.

CORRECTION

With regard to the obituary notice of the late Brigadier E. S. W. Peatt, published last week, we are advised that the operation on the vocal cords of mules for General Wingate's command was not his work, as stated. The credit belongs to Brigadier C. M. Stewart to whom we tender our apologies.

A National Survey of Diseases of the Dairy Cow: the Sample of Herds

BY

F. B. LEECH

Rothamsted Experimental Station

SUMMARY.—A discussion of the factors taken into account when specifying a sample of herds suitable for this survey is followed by a description of the technique of drawing the sample by random selection.

AN attempt is now being made to estimate the incidence over the whole country of all the principal diseases of the dairy cow and to assess their relative importance. This work is being undertaken by the Animal Health Division of the Ministry of Agriculture, Fisheries and Food and is being supervised by Dr. F. W. Withers.

Apart altogether from the vast amount of work required for a complete postal census of farms, it was clearly perceived by those responsible for planning this project that no such census could be expected to produce even tolerably reliable results, mainly because only a small proportion of farmers would take the trouble to fill in a questionnaire sent to them by post or would in fact have available—or be prepared to keep—the records from which a sufficiently informative questionnaire could be answered. Those owners who have in the past provided such information have been found to be well above the general level of efficiency in other ways, so that an attempt at a complete census would almost certainly provide information about an unforeseeable proportion of the better-run farms, little or none about herds under more ordinary management, and certainly no means of calculating a reliable national average.

The present survey is based on a representative small sample of herds, the necessary information being elicited partly from simple records kept at the farm and partly by questioning the man in charge of the cows. This paper describes the problems involved and the method used for obtaining an appropriate sample of dairy herds.

Size of Sample

A sample of 1,500 farms seemed to be a reasonable target, and calculations showed that this should provide details of 25,000 to 30,000 cows, and that the estimates of the incidence of any disease of general importance would be accurately determined from such a sample. For example, one would expect to obtain records of 120 to 150 cases of a disease affecting about half per cent. of the population, and this number would be sufficient to show also whether there were substantial differences in incidence between different parts of the country and between the major breeds, even for relatively unimportant diseases. The results are expected to be proportionately more valuable for the more common diseases, since for these diseases the data can usefully be broken down into more subgroups and can therefore be examined in greater detail.

A sample of 1,500 herds represents about 1 per cent. of the dairy herds of Great Britain, but a preliminary study of the information available showed that a straight 1 per cent. sample would be unsatisfactory for a number of reasons. Table I shows the distribution of herd size in a few selected counties together with the average for England and Wales. This Table, and Table II, are compiled from national statistics made available by the Milk Marketing Board. It was clear that a straight 1 per cent. sample would contain too large a proportion of small herds and, particularly in some areas, very few, if any, large herds. Thus, in such a sample one would expect to find that about 45 per cent. of the herds had only 5 to 14 cows. It is of course necessary to have information on the small herds, but not at the expense of neglecting the large herds which, as will be seen from Table II, frequently contain a high proportion of the dairy cows of a county. For example, in Cheshire 30 per cent. of the herds have 5 to 14 cows, but 47 per cent. of the cows are in herds of 35 or more cows. Visits to small herds are also relatively uneconomic, for the obvious reason

TABLE I

PERCENTAGE OF TOTAL HERDS IN EACH HERD-SIZE GROUP

	Number of cows per herd					Total herds
	0–4	5–14	15–24	25–34	35+	
Cheshire	10.1	30.3	23.5	14.9	21.2	5,600
Devon	9.1	57.6	24.4	6.2	2.7	9,900
Wiltshire	3.5	22.4	25.9	17.1	31.1	3,000
Anglesey	10.9	69.6	15.2	2.9	1.4	1,100
Mean for England and Wales	9.3	45.1	25.1	10.4	10.1	
Total herds in England and Wales						141,400

TABLE II

PERCENTAGE OF TOTAL COWS IN EACH HERD-SIZE GROUP

	Number of cows per herd					Total cows
	0–4	5–14	15–24	25–34	35+	
Cheshire	0.9	12.8	20.3	19.4	46.6	126,800
Devon	1.4	41.2	34.7	13.5	9.2	130,800
Wiltshire	0.3	8.1	17.9	18.0	55.7	82,200
Anglesey	2.0	58.6	25.9	7.5	6.0	12,200
Mean for England and Wales	1.1	24.9	28.0	17.7	28.3	
Total cows in England and Wales						2,417,200

that one would have to visit 10 herds of 5 cows to get as much information as one could obtain from one herd of 50 cows. It was therefore decided to omit altogether the very small herds (say, 1 to 5 cows) and to take in most areas less than 1 per cent. of the herds of size about 6 to 20 cows, and more than 1 per cent. of the bigger herds.

The dairy herds are relatively concentrated in the west of the country, and it was found that 1 per cent. of the herds in many of the eastern counties would provide too little information for any assessment of the disease position there. The same applied to most parts of Scotland. In Scotland and the eastern counties of England the ratio of field staff to dairy herds is relatively high, and it was found that a sample of greater than 1 per cent. would still be a relatively small allocation per field officer.

Thus it was necessary to vary the proportion included in the sample from area to area, and the appropriate sampling fractions were decided on after considering the distribution of herd size, density of the dairy cattle population, and numbers of field staff available in all parts of the country. The number of different sampling fractions was kept to a minimum, with the intention of avoiding undue complication in the subsequent analysis of results.

A few areas of Scotland were not sampled because of inaccessibility, which would have made the cost of collecting the data high relative to the value of the information.

Technique of Sampling

It is unnecessary nowadays to stress the need for random sampling in survey work, the arguments having been fully discussed elsewhere (Yates, 1953). The practical problems of random sampling on a large scale do, however, vary considerably, so that it seems worth while to put on record an outline of the technique adopted for the present survey, which is the first attempt, in this country at any rate, to collect national statistics on veterinary matters.

The first requirement is, of course, a list of all dairy herds and enquiry showed that the Milk Marketing Boards, of which there are 4 in the country, had such lists available in forms convenient for sampling. The 4 Boards are the Milk Marketing Board, Thames Ditton, which covers England and Wales; the Scottish Milk Marketing Board, Glasgow, which covers the south of Scotland; the Aberdeen Milk Marketing Board which covers a few counties around Aberdeen, and the North of Scotland Milk Marketing Board, at Inverness, which deals with the north of Scotland and the Orkneys.

The English and the Glasgow lists, being the data relevant to monthly payments for milk sold to the Boards, were on Hollerith cards. On these cards were punched, besides the reference numbers of the herds, the amount of milk sold to the Board in the month, this last being, for the purposes of this survey, an adequate index of herd size. It was possible, therefore, to devise a mechanical technique of sampling without which the labour involved would have been formidable. The Aberdeen and North of Scotland Boards covered only about 1,000 herds between them, and sampling direct from the written lists was a relatively small undertaking.

Producer-retailers had to be sampled separately from wholesalers, because the amount of milk sold retail was not punched on the cards. A preliminary 5 per cent. sample of producer-retailers was drawn and the total milk sold by each producer in this sample was ascertained from the Milk Marketing Board. The producer-retailers could then be divided, on the basis of milk produced, into the same groups as the wholesalers and sampled in the same proportions.

The mechanical sampling devised consisted essentially in sorting the Hollerith cards into the various regional and size groups that were to be sampled (see Tables III and IV), then arranging each group of cards in random order by using digits of the producer number and the number of gallons of milk, that were related to the herd in a purely random fashion. The last 3 digits of the producer number and the last 2 of the gallonage were used, after a preliminary check to see that their distribution could be assumed to be random. When the cards had been arranged into the required packs and a sample of n herds was to be drawn from any pack, the cards were randomised by 5 sortings, using in random order the 5 columns punched with the above-mentioned digits. If the last digit used were the tens digit of the gallonage, at the end of sorting there would be 10 packs each containing all the cards with one of the numbers 0 to 9 as the tens digit. One of these packs was then selected at random and the first n cards taken from the sample, a few extra being added in case substitutes were required. The following schedule shows the numbers of herds sampled in each size group and area, and the proportions drawn (Tables III and IV). The groups <200 gallons (not sampled), 200 to 999 gallons, and 1,000 + gallons per month correspond roughly to herds of 1 to 5, 6 to 19, and 20 + cows. In the Aberdeen area, the number of cows per herd was available on the lists, so that no approximation to herd size groups was necessary. In the North of Scotland area, the lists available (June, 1956) indicated that the average yield per cow in that month was 76 gallons. Herds producing over 380 gallons were, therefore, assumed to have 6 or more cows.

Since, for the most part, the packs of cards for several adjoining counties were amalgamated before sampling, the distribution of sample herds per single county was not always in proportion to the number of herds in the county; a deficiency in one county was, however, balanced by a greater proportion in a neighbouring county.

The sampling work on the Hollerith cards took one machine operator about 2 months, after which the addresses of the sampled herds were obtained from the Milk Marketing Boards, re-arranged to correspond to the Divisions of the Animal Health Division, and lists typed out for sending out to the field. The clerical work occupied one typist about another month. The experience obtained in the first effort should enable one to cut by about a third the labour of any future national sampling of dairy herds.

TABLE III
AREAS SAMPLED, FRACTIONS USED AND NUMBERS OF HERDS DRAWN IN ENGLAND AND WALES

Area sampled	Herd-size groups (galls.) 200–999 Sampling fractions	1,000 + Sampling fractions	200–999 No. of herds in sample	1,000 + No. of herds in sample	Total herds in sample
Cumberland, Northumberland and Westmorland	1/200	1/70	17	39	56
Yorkshire, West Riding	1/200	1/70	18	33	51
Durham, East and North Yorkshire, Lincolnshire (Lindsey)	1/200	1/30	34	60	94
Cheshire, Lancashire and Flintshire	1/200	1/70	31	85	116
Derby and Stafford	1/200	1/70	23	62	85
Shropshire and Montgomery	1/200	1/70	17	35	52
Midland counties	1/200	1/70	18	41	59
West Midland counties	1/200	1/70	18	44	62
Norfolk and Suffolk	1/200	1/70	9	27	36
Other Eastern arable counties	1/100	1/35	11	15	26
Carmarthen and Pembroke	1/200	1/70	26	37	63
Cardigan and Denbigh	1/200	1/20	18	43	61
Other Welsh counties	1/200	1/20	22	41	63
Buckingham, Oxford and Isle of Wight	1/200	1/70	7	22	29
Kent, Surrey and East Sussex	1/200	1/70	9	32	41
Somerset	1/200	1/70	14	52	66
Devon	1/200	1/30	32	76	108
Cornwall	1/200	1/20	28	54	82
Dorset and Wiltshire	1/100	1/100	19	39	58
Berkshire and Hampshire	1/100	1/100	18	15	33
West Sussex	1/100	1/100	5	6	11
Essex, Hertfordshire, Middlesex and London	1/100	1/100	5	16	21
Total herds in sample			399	874	1,273

TABLE IV
AREAS SAMPLED, FRACTIONS USED AND NUMBERS OF HERDS DRAWN IN SCOTLAND

Area sampled Scottish M.M.B. area	Herd-size groups (galls.) 200–999 Sampling fractions	1,000 + Sampling fractions	200–999 No. of herds in sample	1,000 + No. of herds in sample	Total herds in sample
Argyll (except North Argyll, Islay, Gigha and Coll, Arran and Bute)	1/30	1/15	5	6	11
Angus	1/30		5		5
Fife and Kinross	1/30		12		12
Perth	1/30		8		8
Dumbarton, Clackmannan and Stirling	1/30		17		17
Renfrew	1/55		9		9
Ayr	1/55		28		28
Wigtown	1/55		11		11
Kirkcudbright	1/55		10		10
Lanark	1/55		19		19
Dumfries	1/55		15		15
Lothians and Peebles	1/30		15		15
Berwick, Roxburgh and Selkirk	1/30		4		4

	Sampling fractions	No. of herds in sample	
*Aberdeen M.M.B. area			
Aberdeen, Banff and Kincardine	1/20	32	32
†North of Scotland M.M.B. area			
Caithness, Ross, Inverness, Orkney and Moray	1/10	39	39
Total herds drawn in Scotland			235

*Sample drawn from herds of 6 or more cows.
†Sample drawn from herds producing over 380 galls. in June 1956.

Acknowledgments.—The samples for the Aberdeen and North of Scotland areas were drawn by Mr. G. J. Davies by courtesy of Dr. D. J. Finney, F.R.S., of the A.R.C. Unit of Statistics, Aberdeen. We are grateful to them, and to the secretaries of the two Boards, for their ready co-operation. The samples
(*Concluded at foot of col.* 1, *overleaf*)

Keratoconjunctivitis in Broiler Chicks

BY

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SUMMARY.—An outbreak of keratoconjunctivitis in broilers is described. Exposure of chicks to ammonia fumes in the laboratory caused similar lesions in 6 out of 10 chicks and it is suggested that the presence of ammonia in broiler houses is the cause of field outbreaks of the disease.

Introduction

DURING the course of studies on the avian leucosis complex, Barber (1947) observed that 25 per cent. of a group of chickens kept under very poor hygienic conditions developed an ulcerative keratitis and severe conjunctivitis when about 16 weeks old. The concentration of ammonia in the rooms in which the birds were kept was so strong that it had caused the paint to peel from the walls. The removal of the diseased chickens to clean, well-ventilated rooms resulted in rapid recovery and it was assumed that the ammonia or other gases formed during faecal decomposition were the cause of the condition.

Bullis, Snoeyenbos, and van Roekel (1950) reported field outbreaks of keratoconjunctivitis in broilers in the United States, which they had first observed in 1943. The annual number seen by them increased to 16 in 1949. They found, in a number of cases, that birds in an individual pen or floor were affected and that the affected groups had been placed on previously used litter whereas chicks placed on fresh litter were not affected. The incidence in affected groups varied from 10 to 50 per cent. The condition was seen in birds from 10 days to 4½ months of age. Although they believed that the cause was closely related to the presence of ammonia in the litter the fact that the symptoms and lesions persisted after the birds were removed to other environments aroused a suspicion that something aside from an environmental factor was the primary cause. Transmission experiments were unsuccessful and these workers were unable to reproduce the condition by exposing chicks to ammonia fumes for a period of 2 weeks.

Field outbreaks of a similar condition were also seen in the United States by Faddoul and Ringrose (1950) and these workers were able to reproduce the condition by subjecting chickens to ammonia fumes. In the first of their experiments 20 4-week-old chickens were exposed to a concentration of 0.1 per cent. of ammonia by volume in the air of a closed room for 2 weeks, followed by approximately 0.2 per cent. by volume for a further 3 weeks. Eighteen of the chickens developed keratoconjunctivitis during this period. In a second trial, 8 9-week-old chickens were subjected to an approximately 0.1 per cent. concentration of ammonia in the atmosphere in a closed, isolated room. Ocular injury first became apparent after 3 weeks of continuous exposure and was quite severe at the end of the fourth week. All 8 birds developed keratoconjunctivitis but no deaths occurred either in this, or in the previous group.

Recently, Wright and Frank (1957), in Canada, have also reproduced the condition by exposing chicks to ammonia fumes.

History

The condition was first seen at this laboratory in April, 1956, since when a further 5 outbreaks have been observed. In each of these outbreaks the disease occurred in broiler chicks reared on previously used litter and the symptoms were first noticed in birds between 2 and 3 weeks of age. The estimated incidence within a batch varied from 2 to 30 per cent., but the mortality rate was generally low and was usually less than 5 per cent. of affected birds.

In December, 1956, following the receipt from a large-scale broiler producer of live birds, all of which showed bilateral corneal ulceration with severe conjunctivitis, a visit was made to the premises. The disease had occurred in a broiler house which was divided by wire netting into 4 equal sections. The total capacity of the house was 10,000 birds which were 3½ weeks old at the time of inspection. The litter, which had been in use for nearly 2 years, was dry and in good condition. Six batches of birds had previously been reared on this litter with no apparent disease and an average mortality rate of only 2 per cent.

In the first 2 sections of the house the majority of the birds appeared to be healthy and, on examination of 20 specimens only 2 were found to be affected. In the other 2 sections, however, a large number of the birds were observed to be standing in a dejected way and with closed eyes below the hot water brooders. On examination of 40 birds from these sections, no less than 32 showed keratoconjunctivitis. Diseased birds could be easily detected as each was found to have damp and matted feathers on the back, between the wings, the result of rubbing the eyes to relieve

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A National Survey of Diseases of the Dairy Cow.—*Concluded.*

for England and Wales, and the south of Scotland, were drawn at Rothamsted and the respective Milk Marketing Boards kindly provided lists of addresses and gave every help over troublesome and sometimes tedious queries.

Reference

YATES, F. (1953). "Sampling Methods for Censuses and Surveys." 2nd edition. London: Charles Griffin & Co.

the intense pruritis, which is a feature of the condition. Making allowance for the fact that affected birds were easier to catch than healthy specimens, it was estimated that at least 3,000 were affected. In all the specimens examined the disease was bilateral.

The birds were of the Light Sussex and White Rock breeds and had been purchased from different sources. The disease had occurred in both breeds thus ruling out the possibility of a genetical cause.

The usual routine of management was to leave the house vacant for 3 weeks between batches, but in this instance one half of the house had been rested for only 10 days and it was in the chicks placed in this half of the house that the high incidence of keratoconjunctivitis occurred. During the interval between batches all caked litter was removed and replaced by fresh shavings and the remainder turned but on this occasion the owner believed that this procedure had not been carried out efficiently as itinerant labour had been employed without proper supervision.

At the time the day-old chicks were brought into the house it was noted that there was a strong smell of ammonia from the litter particularly in the sections in which the chicks later became severely affected, but this was not noticeable when the premises were visited by the writer.

Symptoms

Affected birds stood in dejected attitudes with the eyelids closed. There was marked photophobia and frequent rubbing of the eyes on the wings and back. The eyelids were considerably swollen with congestion of the palpebral vessels and frequently there were petechial haemorrhages on the corneal surface of the eyelids. The corneas showed a central ovoid area of ulceration with an irregular outline measuring approximately 0.5 cm. by 0.25 cm. Over 80 birds were examined and in each case the disease was found to be bilateral. Affected birds showed marked anorexia and were considerably smaller than normal specimens of the same age.

Histopathology

Visceral organs, brains and eyes were fixed in 10 per cent. formol saline, embedded in paraffin wax, sections prepared and stained with haematoxylin and eosin. There were no lesions in the brain or viscera. Sections of the eye showed there to be desquamation of the corneal epithelium, the lesion being central and generally ovoid in shape. There were no lesions in the deeper corneal tissue but in many cases the iris was seen to be infiltrated by polymorphonuclear leucocytes. Congestion of the blood vessels in the eyelids was also seen to be marked and accompanied by considerable oedema of the palpebral tissue. Neither inclusion bodies nor bacteria could be detected in the sections.

Procedure

In an attempt to determine whether antibiotics would be of use in treating the outbreak, 30 affected birds were divided into 3 equal groups. One group was treated with oxytetracycline hydrochloride in the drinking water, the second with penicillin in the water, while the third group was used as a control. In all groups the condition regressed within 4 to 7 weeks but there was no appreciable difference in the recovery rate of control or treated chicks. In the course of this experiment 2 chicks developed glaucoma and were destroyed, but the remainder made a complete recovery.

Vitamin A estimations were carried out on the livers of diseased chicks but the level was found to be satisfactory and it was therefore thought to be unnecessary to carry out estimations of the food.

Experimental

A number of experiments were carried out in an attempt to reproduce the condition.

1. A group of chicks was reared on litter which had been collected from a house where an outbreak had occurred; another group was reared in contact with diseased chicks; repeated transmission experiments were carried out including intra-cerebral inoculation of brain material from diseased chicks. intra-peritoneal inoculation of viscera and direct eye swabs. All these attempts, however, were unsuccessful.

2. Twelve day-old R.I.R. chicks were exposed to ammonia fumes for 14 days, dilute ammonium hydroxide solution being applied to the litter 5 times daily. This failed to produce any ocular lesions and the chicks were destroyed at the end of the period.

3. This experiment was repeated using 10 Light Sussex day-old chicks which were exposed to ammonia fumes for 3 weeks. The chicks were confined in a cage which was partially covered by brown paper in order to concentrate the ammonia fumes and brooding was by a dull emitter infra-red lamp. A 5 per cent. solution of ammonium hydroxide was sprayed onto the litter below the chicks 4 times daily, the chicks being removed during spraying. Apart from initial discomfort immediately following each application of ammonia the birds maintained a good appetite and reared well. At the end of 3 weeks they were removed from the ammonia and reared in clean brooders in well ventilated accommodation.

Results

On the twelfth day of the experiment 3 above, one chick was observed to be showing photophobia and on examination the iris of both eyes showed a change from the normal blue-grey colour to a reddish-brown. On the cornea of one eye a few small areas of erosion were observed and by the following day a well defined ovoid ulcer had developed. A day later the other eye became similarly affected and a bilateral blepharitis developed. Three further cases of keratoconjunctivitis occurred during the period in which the chicks were subjected to the ammonia fumes. At the end of this period the chicks were carefully examined before being placed in fresh accommodation and no lesions could be detected in the eyes of the remaining 6 unaffected birds. Two days later, however, 1 of

these chicks became affected and a further 8 days later another case occurred. Altogether 6 out of the 10 chicks developed the condition. Two of these were killed and sections of the eyes examined. These showed similar pathological changes to those seen in the field outbreak and in neither case was there anything to indicate an infectious condition.

The condition developed initially in one eye but in each case the other eye became affected within 24 hours. The first noticeable symptom was the change in the iris colour which is believed to be due to an infiltration of the iris by polymorphonuclear leucocytes and this was associated with symptoms of photophobia. When the corneal ulcer had developed the eyelids were kept tightly closed and the chicks stood about in dejected attitudes. Pruritis was shown by the chicks rubbing their eyes on the wings and back and this became particularly noticeable during the time when the corneal lesion was regressing. Healing took place by regeneration of the corneal epithelium and was complete within 4 to 7 weeks.

Marked anorexia was shown during the period the birds were affected and non-affected birds were almost twice as heavy at 6 weeks of age. Once the birds had recovered, however, the appetites improved although the affected birds had not become as heavy as the non-affected ones when the experiment was terminated at 9 weeks.

Discussion

Three apparently different types of keratitis and keratoconjunctivitis have been described in birds. Coles (1940) in South Africa, reported a conjunctivitis in the domestic fowl associated with a rickettsia-like organism; Clapham (1950) described a keratitis in pheasants following treatment with phenothiazine and Barber (1947), and later Bullis, Snoeyenbos and van Roekel (1950) and Faddoul and Ringrose (1950), reported a keratoconjunctivitis in chickens in the United States which appeared identical to the condition described in this article.

The first attempt at this Laboratory to reproduce the condition by exposing chicks to ammonia failed, and it is believed that this may have been due to the experiment being terminated too soon (*i.e.*, after 2 weeks). In a subsequent experiment ammonia was applied to the litter 4 times daily for a period of 3 weeks. Even under these conditions, where the degree of exposure to ammonia was severe, the first case did not occur until the twelfth day of the experiment and 3 other cases did not develop until the third week. It is of interest that 2 of the chicks developed the condition after they had been removed from the ammonia and the fact that in one there was an interval of 10 days between exposure and development of lesions suggests that ammonia may have a delayed action effect. It may also help to explain why, in field outbreaks, the concentration of ammonia in the atmosphere may not appear excessive at the time outbreaks are being investigated.

The results of the transmission experiments indicate that the condition is not due to an infectious agent. The reports by Faddoul and Ringrose (1950), and Wright and Frank (1957), and the results at this Laboratory suggest that the field condition described here is identical to that reported in the United States and Canada and that it is caused by ammonia fumes, probably the result of faecal decomposition.

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N.A.A.S. STAFF REFRESHER COURSE

An interesting, and indeed compendious, programme which included a paper by Mr. G. N. Gould, President of the R.C.V.S., was arranged for the Staff Refresher Course of the S.E. Region of the N.A.A.S. which was held at Wye College on December 30th, 31st, and January 1st. The following papers were read:—

"Feeding Standards: (a) Dairy Cattle; (b) For Rearing and for Beef Cattle," Dr. K. L. Blaxter, Hannah Dairy Research Institute. Chairman, Mr. D. Skilbeck, C.B.E., M.A., Principal, Wye College.

"The Concentrate System of Feeding Dairy Cows," K. N. Russell, Principal, Yorkshire (W.R.) Institute of Agriculture. "Forage Farming for Dairy Cattle," J. R. Stubbs, C.A.O., Bucks. A.E.C. "An Economic Comparison of the Two Systems of Dairy Cow Feeding," C. H. Blagburn, F.M.I.O., Reading University. Chairman, Professor H. G. Sanders, Chief Scientific Adviser, Agriculture.

"Principles of Feeding Young Cattle," A. Eden, Regional Nutrition Chemist, Eastern Region. "Current Research on Cattle Rearing and Young Dairy Stock Management," A. S. Foot, N.I.R.D., Reading. Chairman, Mr. F. C. Collins, Regional Advisory Chemist (Nutrition).

"Feeding for Beef Production," A. J. Brookes, School of Agriculture, Cambridge. Chairman, Mr. R. O. Smith, Regional Livestock Husbandry Officer.

"Disorders Associated with Faulty Feeding," G. N. Gould, J.P., M.R.C.V.S. Chairman, Mr. Eric Rea, Regional Director, N.A.A.S.

General Discussion and Summing Up, Dr. K. L. Blaxter.

At a joint session with horticultural A.O.s, Mr. W. E. Stedman, M.A.F.F., gave a talk on "World Food Production Trends and Their Impact on Economic Policy."

Towards the end of his paper, Mr. Gould emphasised the need for closer co-operation in the future between the profession and the N.A.A.S. The views he expressed were cordially agreed by all those present.

Current Literature

BOOK REVIEWS

Parthenogenesis and Polyploidy in Mammalian Development. R. A. BEATTY. Cambridge University Press. 15s.

This book is one of a series of monographs in experimental biology which are being published by the Cambridge University Press. The topic is one of great fundamental interest but, in addition, presents aspects which are of special interest to workers interested in applied problems of animal breeding. The scope of the book can best be illustrated by quoting Dr. Beatty. He says "Two common assumptions in the study of mammalian development have been challenged in recent years. The first is that an embryo can arise only after the fusion of a male and female germ cell. The second assumption is that the matured germ cells must each carry the reduced or haploid number of chromosomes which combine to give a double or diploid set in the zygote at fertilisation. For the mammalian embryo it is now clear that neither assumption is inevitable. Parthenogenetic mammalian embryos can develop from an egg which has not been fertilised by a spermatozoon. Heteroploid chromosome numbers can occur; germ cells need not necessarily be haploid, nor embryos diploid." This passage is from Chapter VII "Conclusions"; in the preceding chapters is found the evidence for these conclusions.

Dr. Beatty begins with an introduction to the terminology and techniques of his subject. His subsequent approach is to consider in turn the theoretically possible routes of development of the mammalian embryo; to show what, at the end of any particular route, are the cytological consequences as regards chromosome number and to examine their effects on the organism. The known (or postulated) routes of development are classified into two major groups and one minor group. In the first major group the routes are those taken during parthenogenetic development. It is shown that, depending on the route of development, parthenogenetic embryos may have the same number or half, 2, or 4 times as many sets of chromosomes per cell as the normal (diploid) embryo. In the second group the routes are those which may be taken when an ovum is fertilised by a spermatozoon; here the embryo may contain the normal number (in normal development) or up to 5 times this number. The explanations in the text of the possible routes (8 in each of the 2 major groups) are supplemented very successfully by diagrams. The evidence for the occurrence of development by any of the above routes is dealt with under 2 headings according to whether it deals with spontaneous development by that route or with development where the route is determined by experimental treatment. It is in his critical evaluation of the mass of available evidence that one recognises Dr. Beatty's authority in this field.

Various aspects and implications of parthenogenetic and polyploid development are discussed, and veterinarians will be particularly interested in his discussion of the question "Do spontaneously parthenogenetic mammals ever come to term?" He suggests that there are reasons for the belief that occasionally they do, and points out that there are certain factors which tend to operate against the recognition of parthenogenetic births, and that in existing circumstances a rare case would seldom come to light, even if the birth were to an unmated animal; it would be even less likely to be recognised if it were born to a *mated* animal. As an approach to the identification of the existence of parthenogenesis, he suggests that if we list births which occur without the apparent intervention of the male, then, if some of the births are genuinely parthenogenetic, all these offspring should be females; and within the total data there should be an excess of female births. A similar approach could be made to other data, *e.g.* from recorded cases of apparent superfoetation to examine the possibility that some cases of superfoetation are, in fact, examples of parthenogenetic development.

I cannot conclude without comment upon what seems to me, as a veterinarian, a delicious example of scientific caution. Dr. Beatty says that in the dog, silver fox, and *pony* (my italics) ovulation occurs before the first polar body is formed. It is the scrupulousness about the pony that intrigues me. I have a mental picture of the author sternly rejecting the temptation to stretch the evidence to cover horses measuring more than 14 hands!

I believe that this book will be regarded as the authoritative work on the subject for many years to come; those veterinarians who read it will, I have no doubt, feel grateful to the author, as I do, for compiling with such admirable clarity this critical survey of existing knowledge in a field of biological science which is likely to demand our increasing attention in the next decade.

What Makes a Good Horse—Its Structure and Performance. R. H. SMYTHE, M.R.C.V.S. "Country Life"; London, 1957. 21s. net.

The chapters which comprise the 122 pages of this book are arranged under the following headings: Introduction, Minor Anatomy, Concussion and its Control, the External Surface of the Body, Conformation and some Defects, The Horse in Motion, Conformation and Work, On Selecting a Horse.

The book is dedicated to the "younger generation of horse-lovers, particularly members of the Pony Clubs . . ."

It will be appreciated that the objectives which the author sets out to fulfil are consequently limited, though still very important, and the book must be assessed accordingly. Ideas and ideals are described and discussed, and the book is vividly illustrated with 18 good photographs, 3 folding charts, and 34 line diagrams. Some of the latter might be criticised as somewhat crude if the author had not included in his introduction the disarming phrase—"anatomical figures . . . are purely diagrammatic and intended to give the younger readers a general impression . . ."

The book is written in a simple, sympathetic, and attractive style which should be readily followed and understood by those for whom it is intended. Parallels, similies, and even anecdotes are used extensively to emphasise points or to reinforce explanations, but a general impression is left that some degree of over-simplification of what are in fact extremely complex phenomena has crept into the text from time to time.

It is but fair to indicate, however, that the author had before him a very difficult task in analysing equine form and function so that these might be presented in a style which could be understood and appreciated. He has been content to describe the major features of good and bad conformation, and instead of making merely opinionative or dogmatic statements has gone to much trouble to give and explain his reasons for preferences or dislikes. This is to be commended, since the shrewd juvenile to-day is by no means content to be told, for example, that a horse should have a " good sloping, well-laid back shoulder "; he (or she) wants to know what *is* a good sloping, well-laid back shoulder, and *why*.

Those sections dealing with conformation from different aspects are good and should be readily understood, but whether the experienced horseman will always agree is another matter. In the horse, where performance is so much more important than appearance, and where orthodox opinions are so often confounded by unexpected results, controversies regarding the ideal type of conformation will ever arise and will ever rage.

Perhaps the least satisfactory chapter is that dealing with the Horse in Motion, which has perforce had to be over-simplified. However, the young equestrian should gain a perfectly good working knowledge of the essential details of the movements at various paces, if he reads it carefully. The book ends with some useful and very practical advice to the novice who wishes to select a horse or pony, indicating that questions of soundness should be left to the veterinary surgeon.

The veterinary student in his early years at college will find this book a useful introduction to horsemanship and need not feel at all humiliated in having an elementary book recommended to him. The veterinary surgeon in practice who is asked to suggest a useful book for children who are being initiated into the art of horse-mastership, can recommend this book without hesitation, and even he, mature and experienced as he is, may find it interesting and useful to read in his moments of relaxation.

The Nature of Viruses (Ciba Foundation Symposium). Edited by G. E. W. WOLSTENHOLME and E. C. P. MILLER. J. and A. Churchill Ltd., London, 1957. Pp. xii and 292. 42s. net.

A small group of the world's leading virologists took part in this symposium held in 1955. Seventeen papers dealing with the fundamental aspects of experimental virus infection, particularly from the chemical and physical point of view, were presented, each paper being followed by a full and searching discussion. The papers and the discussion form the substance of this book, which will be of great interest to the specialist in this particular field of research. It is only to him that this book can be recommended. The general reader will find most of it, by virtue of its very specialised nature, difficult to follow.

Breeding Methods for Cattle, Pigs and Poultry in the United States. The European Productivity Agency of the Organisation for European Economic Co-operation. Paris, 1957. 14s.

In 1955 21 leading experts on animal production from 8 European countries, including 2 from the United Kingdom, went to the United States for a 6-week visit in order to study the main federal and state institutions for cattle, pig, and poultry production. When the mission returned, they met at O.E.E.C. heaquarters and the report, which is reviewed here, was drawn up.

All those interested in animal breeding are advised to see this publication. Extending to over 200 pages, it gives an excellent account of modern trends in animal breeding in the United States, including the organisation of practical breeding work and interstate co-operation. The report contains a great deal of factual information, and while it cannot be described as particularly well presented, much of the information has not been summarised before and its presentation in one volume will be found most helpful.

A useful feature of the report is the manner in which differences between American and European methods are pin-pointed—for instance it shows how in pigs and poultry the accent in the United States is on in-breeding followed by cross-breeding, whereas in cattle breeding there is more similarity than difference in the two continents' approach, pure breeding still being the basis for improvement.

It is a pleasure to welcome and recommend this booklet.

THE BRITISH CARIBBEAN VETERINARY ASSOCIATION

The British Caribbean Veterinary Association is sponsoring its third veterinary convention in Trinidad, B.W.I., from May 25th to 31st, 1958. The first was held in Trinidad in 1954, and the second in Jamaica in 1956.

At the previous Conventions prominent speakers and clinicians attended. Among them were Dr. Quinn, Past President of the A.V.M.A., Professor Robertson of Edinburgh, Dr. Taylor of Weybridge, Professor Henderson of Ontario Veterinary College, Dr. Roberts of Cornell, and Dr. Archibald of Ontario Veterinary College. For the 1958 Convention the Association is already assured of the services of Mr. G. N. Gould, President of the Royal College of Veterinary Surgeons, and Mr. Gordon Knight; Dr. Charles Bild, Miami, Florida, Dr. Milne of Ontario Veterinary College, and probably Dr. E. Tierkel will be among other distinguished visitors.

There will be two days of lectures, two days of surgical demonstration and clinics in both large and small animals, and one day of films. In addition, there will be an opportunity for excursions to places of interest in the Island.

News and Comment

THE NEW YEAR HONOURS

We are happy to record that the following members of the profession were honoured in the New Year List.

The C.B.E. was awarded to Mr. L. Hughes, Deputy Chief Veterinary Officer, Animal Health Division, and to Mr. W. E. Lancaster, Director of Veterinary Services, Malaya.

The M.B.E. was awarded to Mr. H. R. Clifford, Veterinary Officer, Uganda, and to Mr. W. W. Kirkby, Senior Veterinary Officer, N. Nigeria; and the B.E.M. was awarded to Mr. M. M. Mauley, Senior Veterinary Inspector, Sierra Leone.

All their colleagues will wish to congratulate these gentlemen on the distinction they have brought to their profession and to themselves.

TESTING OF VETERINARY MEDICINES

The following important note has been received from the Agricultural Research Council.

There has been a recurrent suggestion that in view of the many substances which are now being marketed for the prevention, cure, and control of animal diseases, there is need of some scheme whereby the value of particular substances may be tested under field conditions by an impartial body. As the result of discussions with representatives of the British Veterinary Association and of the Association of British Pharmaceutical Industry, the Agricultural Research Council have now initiated a scheme by which tests can be carried out under the authority of a Veterinary Therapeutic Testing Board appointed for the purpose by the Council.

It is intended that tests shall normally be made on the initiative either of a manufacturer of the substance concerned or of an organisation representing the veterinary profession, and that they shall be carried out by practising veterinary surgeons, who will be invited to co-operate, in accordance with a plan prepared by a group representing those interested in the test.

The Board, of which the Chairman is Mr. M. Noble, includes members appointed by the Council after consultation with the Royal College of Veterinary Surgeons, the British Veterinary Association, the Pharmaceutical Society, the Association of British Pharmaceutical Industry, and the Medical Research Council.

Copies of the Scheme and of a leaflet stating the General Conditions governing tests can be obtained from the Secretary, Veterinary Therapeutic Testing Board, Agricultural Research Council, Cunard Building, 15, Regent Street, London, S.W.1, to whom any communications should be addressed.

[It is hoped to deal with this matter in more detail next week.—*Editor.*]

BULL FERTILITY REPORT FORMS

In the SUPPLEMENT this week there is enclosed, in loose form, a pamphlet comprising a suggested form for noting details of bull fertility, together with explanatory notes. It is hoped that this document will be of practical value to members of the Association. For those who wish to use the form in the course of their work, arrangements have been made with our printers, Messrs. H. R. Grubb Ltd. of Poplar Walk, Croydon, Surrey, to supply pads of 50 forms with blank duplicating sheets. These, inclusive of purchase tax and postage, will be available *direct from the printers* at £1 7s. 6d. each if bearing the name and address of the practice, or £1 2s. 6d. without these details.

THE ROYAL SOCIETY OF HEALTH CONGRESS

The Royal Society of Health Congress is being held this year at Eastbourne from April 28th to May 2nd.

Professor Lovell of the Royal Veterinary College has been elected this year's President of the Veterinary Hygiene Section and the programme is taking the form of a Symposium, "Some Lesser-known Diseases Common to Man and Animals." This will take place on Wednesday, April 30th from 2.30 p.m. to 5.30 p.m. The subjects will be:—

"Bacterial Infections" by J. A. Boycott, M.A., D.M., M.R.C.S., L.R.C.P., Director, Public Health Laboratory (Medical Research Council), Taunton;

"Virus Infections" by F. O. MacCallum, B.SC., M.D., L.M.S., Virus Reference Laboratory, Central Public Health Laboratory (Medical Research Council);

"Parasitic Infestations" by E. L. Taylor, C.B.E., D.V.SC., M.R.C.V.S., D.V.H., N.D.A., N.D.D., Deputy Director, Ministry of Agriculture Veterinary Laboratories, Weybridge.

The discussion will be opened by Mr. W. Tweed, F.R.C.V.S., D.V.S.M., of the Ministry of Agriculture, Dr. J. F. Warin, M.D., D.P.H., Medical Officer of Health, City of Oxford, and Mr. E. H. C. Wadhams, M.A.P.H.I., A.M.I.P.H.E., Chief Public Health Inspector, Witham Urban District Council.

The President of the Congress will be the Minister of Health, the Rt. Hon. Derek Walker-Smith.

UNIVERSITY NEWS

Bristol

The following candidates passed the Final Examination for the degree of B.V.Sc. (Section II):

Ashton, Wilfred L. G.; Eaton, Michael R.; Geldart, Peter H.; Griffiths, Joseph D. L.; Hague, Peter H.; Sommerville, Barbara A.; and Wilson, George W. C.

London

Bachelor of Veterinary Medicine, Royal Veterinary College

HONOURS. Baldwin, Basil Arthur; Griffin, Richard Michael; and Mann, Peter George Hubert.

PASS. Churchill, Anthony Edward; Davidson, William Roy; Dyson, Peter Travis; Edney, Andrew

Thomas Bailey; Embleton, Gerald Anthony; Ezebuiro, Emmanuel Ogoegbulam; Fisher, Betty Margaret; Harries, Benjamin Llewelyn; Jackson, Faith; Jones, Willie David; Knowles, Robert Thomas; Martin, Charles Anthony Wyndham; Millett, John Douglas; Randlesome, Anthony George Charles; Rodgers, Samuel Edgar; Rutty, Donald Arthur; Sykes, Kenneth Chadwick; Taylor, John Michael; Thornton, David Alexander Kennedy; and Turner, William Trevor.

The following Candidate has passed in Part II:—

Southerton, Anthony George.

The following Candidate has passed in Part III:—

Bowen, John Meirion.

LARGE-ANIMAL SURGERY

A course of two lectures on "Problems Associated with Large-animal Surgery," by Professor J. G. Wright, Dean of the Faculty of Veterinary Science and Professor of Veterinary Surgery in the University of Liverpool, will be given at the Royal Veterinary College at 4 p.m. on February 21st and 28th. The titles of the lectures will be "Equine Anaesthesia" and "Bovine Dystocia." At the first lecture the chair will be taken by Dr. K. G. Lloyd-Williams, Dean of the Royal Free Hospital School of Medicine and Dean of the Faculty of Medicine in the University of London.

The lectures are addressed to students of the University and to others interested in the subject; admission is free, without ticket.

THE REGISTER OF VETERINARY SURGEONS

Dr. James Archibald, D.V.M., M.V.SC. (TORONTO), of Ontario Veterinary College, Guelph, was admitted to the Commonwealth List of the Register of Veterinary Surgeons on January 2nd, 1958.

MR. ALASTAIR McCALLUM

Mr. O. V. Gunning writes:—

The early passing of Alastair McCallum will come as a shock to all those who intimately knew him, including many in this district.

On his discharge from the army he came to me as assistant where he stayed until he entered the service of the Ministry.

Conscientious in everything he undertook, he had a heart of great kindness and his word was his bond. It was these qualities which brought him a wide circle of friends here, and although over 10 years have elapsed since his departure, I continue to receive kindly enquiries regarding him. These friends will, I am sure, join with me in extending sympathy to his wife and son.

R.C.V.S. OBITUARY

We record with regret the death of the following member of the profession:—

MARRISON, Edward, Bourne House, Bakewell, Derbyshire. Qualified May 18th, 1898, at the New Edinburgh College. Died December 28th, 1957, aged 81 years.

PERSONAL

Births

HOLMES.—On December 9th, 1957, to Marilyn, wife of Robert G. Holmes, M.R.C.V.S., D.V.S.M., of Leeds, Yorks, W.R., a daughter, Carole Elizabeth.

LANCASTER.—On December 16th, 1957, to Doris, wife of Raymond Lancaster, B.V.SC., M.R.C.V.S., at Ashgate Maternity Home, Chesterfield, a son, Mark.

RIMMER.—On December 19th, 1957, to Beryl, wife of Bernard Rimmer, M.R.C.V.S., of Crosby, Liverpool, a daughter.

Marriages

MANN—BENNETT.—At All Saints' Church, Sanderstead, Surrey, on December 14th, 1957, Michael Mann, LL.B., PH.D., son of Mr. and Mrs. A. B. Mann of Purley, Surrey, to Jean Bennett, B.V.SC., M.R.C.V.S., daughter of Mr. and Mrs. A. W. Bennett of Selsdon, Surrey.

PICKERING—ELY.—In the Church of St. Andrew, Kildwick, Yorkshire, on December 28th, 1957, Eric C. Pickering, B.SC., B.V.M.S., M.R.C.V.S., to Barbara Ely.

COMING EVENTS

January

15th (Wed.). Meeting of the Warwickshire Veterinary Club at the Regent Hotel, Leamington Spa, 8 p.m.

16th (Thurs.). Meeting of the Western Counties Veterinary Association at the Rougemont Hotel, Exeter, 2.30 p.m.

17th (Fri.). Annual Buffet-Supper Dance of the Scottish Metropolitan Division, V.V.B.F. Ladies' Guild, 8 p.m.

22nd (Wed.). Winter Meeting of the North of Scotland Division in the Northern Hotel, Aberdeen, 2.30 p.m.

24th (Fri.). Annual General Meeting of the Mid-west Division, Berkeley Café, Bristol, 2.15 p.m.

25th (Sat.). Meeting of the B.S.A.A., Southern Area, at the Royal Hotel, Winchester, 7.30 p.m. (dinner). 8.30 p.m. meeting.

29th (Wed.). Meeting of the B.S.A.A. Midland Region at the Radbrook Hall Hotel, Radbrook Road, Shrewsbury, 2.30 p.m.

February

7th (Fri.). Annual Ball of the Royal (Dick) School of Veterinary Studies in the Assembly Rooms, George Street, Edinburgh, 9 p.m.

14th (Fri.). General Meeting of the Society for the Study of Animal Breeding at the B.V.A., 7, Mansfield Street, Portland Place, London, W.1, 11 a.m.

General Meeting of the Society of Practising Veterinary Surgeons in the Radbrook Hall Hotel, Shrewsbury, 8 p.m.

20th (Thurs.). Ordinary Meeting of the Ayrshire Veterinary Association in the Ailsa Lounge, Ayr Station Hotel, 2.30 p.m.

B.V.A. COUNCIL AND COMMITTEE MEETINGS

Wednesday, January 22nd, 1958, at No. 7, Mansfield Street, W.1.

10.00 a.m. Veterinary State Medicine Committee.
11.30 a.m. Small-Animals Committee.
2.00 p.m. Farm Livestock Committee.

Thursday, January 23rd, 1958, at No. 7, Mansfield Street, W.1.

10.00 a.m. Parliamentary and Public Relations Committee.

11.30 a.m. Home Appointments Committee.
12.30 p.m. Finance Sub-committee.
2.15 p.m. General Purposes and Finance Committee.

Friday, January 24th, 1958, at the Connaught Rooms, W.C.2.

10.30 a.m. Council Meeting.

FOOT-AND-MOUTH DISEASE

The areas described in the schedules below are declared to be Infected Areas for the purpose of preventing the spread of foot-and-mouth disease:—

IN THE COUNTY OF ESSEX

The Boroughs of Colchester, Walthamstow, Chingford, Leyton, and Wanstead and Woodford.

The Petty Sessional Division of Waltham Abbey.

In the Petty Sessional Division of Lexden and Winstree: The parishes of Elmstead, Wivenhoe, East Donyland, Abberton, Peldon, West Mersea, East Mersea, Brightlingsea, Alresford, Fingringhoe and Langenhoe.

In the Petty Sessional Division of Tendring: The parishes of St. Osyth, Great Clacton, Frinton and Walton, Little Bromley, Thorpe le Soken, Beaumont cum Moze, Great Oakley, Tendring, Little Bentley, Great Bromley, Frating, Thorrington, Great Bentley, Weeley, Little Clacton and Ardleigh, and so much of the parishes of Lawford, Mistley, Bradfield, Wix and Wrabness as lies to the south of the main road running from Ardleigh *via* Mistley to Harwich, excluding the said road.

In the Petty Sessional Division of Harwich: The parish of Little Oakley and so much of the parish of Ramsey as lies to the south of the main road running from Bradfield to Harwich, excluding the said road.

In the Petty Sessional Division of Harlow: The parish of Roydon.

In the Petty Sessional Division of Epping: The parishes of Nazeing, Epping Upland and Buckhurst Hill and so much of the parishes of Loughton, Theydon Bois, Theydon Garnon and Epping as lies to the north and west of the railway from Woodford Green to Chipping Ongar, excluding the said railway.

IN THE COUNTY OF MIDDLESEX

The Boroughs of Hendon, Finchley, Hornsey, Wood Green, Tottenham, Edmonton, Southgate and Enfield.

The Petty Sessional Division of South Mimms.

In the Petty Sessional Division of Highgate: The parish of Friern Barnet.

IN THE COUNTY OF HERTFORD

The City of St. Albans and the Borough of Hertford.

The Petty Sessional Divisions of Barnet, Hatfield and Cheshunt.

In the Petty Sessional Division of Hertford and Ware: The parishes of Stanstead Abbots, Little Amwell, Stanstead St. Margarets, Great Amwell, Ware Urban, Stapleford, Bramfield, Tewin, Hertingfordbury, Essendon, Little Berkhampstead, Bayford and Brickdendon Liberty.

In the Petty Sessional Division of Welwyn: The parish of Welwyn Garden City.

In the Petty Sessional Division of St. Albans: The parishes of Sandridge Rural, Colney Heath, London Colney and St. Stephen.

In the Petty Sessional Division of Watford: The parish of Aldenham.

IN THE COUNTY OF LANCASTER

In the Petty Sessional Division of Warrington: The parish of Woolston.

IN THE COUNTY OF DORSET

In the Petty Sessional Division of Sherborne: The parishes of Trent, Sandford Orcas, Poyntington, Oborne, Castleton, Nether Compton, Over Compton, Bradford Abbas, Sherborne, Goathill, Haydon, Purse Caundle, North Wootton, Thornford, Clifton Maybank, Beer Hackett, Lillington, Leweston, Folke, Caundle Marsh, Holnest, Yetminster, Ryme Intrinseca, Melbury Osmond, Stockwood, Chetnol, Leigh and Longburton.

In the Petty Sessional Division of Bridport: The parish of Halstock.

IN THE COUNTY OF SOMERSET

The Borough of Yeovil.

The Petty Sessional Division of Yeovil.

In the Petty Sessional Division of Wells: The parishes of Butleigh and Baltonsborough.

In the Petty Sessional Division of Shepton Mallet: The parishes of East Pennard, West Bradley including its detached part, Ditcheat and Lamyatt.

In the Petty Sessional Division of Somerton: The parishes of Compton Dundon, Barton St. David, Lydford, Somerton, Kingweston, Keinton Mandeville, Pitney, Charlton Mackrell, Babcary, Long Sutton, Kingsdon, Muchelney and Kingsbury Episcopi.

In the Petty Sessional Division of Wincanton: The parishes of Burton, Ansford, Pitcombe, Charlton Musgrove, Lovington, Alford, Castle Cary, Shepton Montague, Penselwood, North Barrow, North Cadbury, Yarlington, Bratton Seymour, Cucklington, Stoke Trister, Wincanton, Holton, Maperton, Compton Pauncefoot, South Barrow, Sparkford, South Cadbury, Charlton Horethorne, Corton Denham, North Cheriton, Horsington, Abbas and Temple Combe and Milborne Port.

In the Petty Sessional Division of Ilminster: The parish of South Petherton.

In the Petty Sessional Division of Crewkerne: The parishes of West Chinnock and Haselbury Plucknett.

IN THE COUNTY OF CHESTER

In the Petty Sessional Division of Broxton: The parishes of Churton Heath, Golborne David, Handley, Lea Newbold, Buerton, Aldford, Edgerley, Churton by Aldford, Churton by Farndon, Kings Marsh, Coddington, Aldersey, Clutton, Barton, Stretton and Carden.

In the Petty Sessional Division of Chester Castle: The parishes of Lower Kinnerton, Dodleston, Marlston cum Lache, Claverton, Huntington, Saighton, Eccleston, Eaton, Poulton and Pulford.

IN THE COUNTY OF DENBIGH

In the Petty Sessional Division of Bromfield: The parish of Burton.

IN THE COUNTY OF FLINT

In Petty Sessional Division of Hope: The parishes of Higher Kinnerton and Hope.

IN THE COUNTY OF DEVON

The Petty Sessional Division of Kingsbridge.

In the Petty Sessional Division of Totnes: The parish of Moreleigh.

In the Petty Sessional Division of Dartmouth: The parishes of Blackawton, Strete and Slapton.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Ches. Poplar Farm, Crowton, Northwich (Dec. 30).
Derbys. Long Doles Farm, Clifton, Ashbourne (Jan. 2).

Fowl Pest

Beds. Allmeads Dairy Farm, Biggleswade (Dec. 30).

Cambs. 14, High Street, Waterbeach (Dec. 30); Flexon Poultry Farm, Wilburton, Ely (Jan. 1), Whitecross Road, Wilburton, Ely (Jan. 3); Thornhill, Wisbech Road, March (Jan. 4).

Hunts. Meadow Lane, Hemingford-Grey, Huntingdon (Jan. 1).

Norfolk. The Stores, Clint Green, Yaxham, Dereham; The Gables, Mattishall, Dereham (Dec. 31); Midhurst, Westgate Street, Shouldham, King's Lynn (Jan. 1); 3, Council Houses, Westgate Street, Shouldham, King's Lynn (Jan. 2); Banyard Farm, Ecling Green, Dereham (Jan. 3); Mill Farm, Toft Wood, East Dereham (Jan. 4).

Lancs. Norris's Farm, Ulnes Walton, Leyland, Preston; 55, Town Road, Croston, Preston; Magnolls Farm Oswaldtwistle, Accrington (Dec. 30); 43, Duddle Lane, Walton-le-Dale, Preston; 20 Smallholding, Knuzden, Blackburn; Birch Green Farm, Carr Lane, Upholland, Wigan; Welsby, North Road, Bretherton, Preston; Fir Tree Farm, Grimsargh, Preston (Jan. 1); South Lawn, Stoney Lane, Forton, Preston; Greenmount, Preston New Road, Freckleton, Preston; Poplar House, Longmeanygate, Leyland, Preston (Jan. 2); Whitehouse Farm, Gill Lane, Longton, Preston; Stanley Coppice, Coote Lane, Lostock Hall, Preston; Moor Hey Farm, Dobb Lane, Little Hoole, Preston; Premises adjoining Leverhouse Farm, Leyland, Preston; Newton Hall Farm, Newton, Kirkham, Preston; Rotherham Top, Whittle-le-Wood, Chorley (Jan. 3); Rigby Farm, Moss Side, Leyland, Preston; Willowcroft, Gill Lane, Longton, Preston (Jan. 5).

Suffolk. Martins Cottage, Wattisfield (Jan. 4).

Yorks. Greystone House, Kirby Wiske, Thirsk (Dec. 30); The Bungalow, Station Road, Sessay, Thirsk (Dec. 31); Site No. 2, Dalton, Thirsk (Jan. 1); The Oaks, Sessay, Thirsk (Jan. 3); The Clevelands, Dalton, Thirsk (Jan. 5).

Swine Fever

Beds. Clay Hill Farms Ltd., Westoning (Dec. 31); Swallowfield Farm, Edlesborough, Dunstable (Jan. 2).

Bucks. 324, Horton Road, Datchet, Slough; The Nurseries, High Street, Colnbrook, Slough (Dec. 31); Fremar, Denham Lane, Chalfont St. Peter, Gerrards Cross (Jan. 1).

Dorset. Redhouse Farm, Motcombe, Shaftesbury; Row Hill Farm, Holt, Wimborne (Dec. 30); 270, Rowe Hill, Holt, Wimborne (Jan. 3).

Essex. Wrens Nest, Broxted, Dunmow (Jan. 1).

Hunts. Primrose Lane Allotments, Huntingdon (Dec. 30).

Leics. The Piggeries, Thurcaston Road (Dec. 30).

Middx. Moor Lane Allotments, Harmondsworth (Jan. 2).

Mon. Chapel Farm, Penhow, Newport (Jan. 1); Piggery, Mendalgief Allotments, Newport (Jan. 2).

Norfolk. Street Farm, Stradbrooke, Diss (Dec. 31); Pond Farm, Hevingham, Norwich (Jan. 3).

Salop. Lyneal House Farm, Lyneal, Ellesmere (Jan. 1).

Suffolk. The Gate House, Risby, Bury St. Edmunds (Dec. 31); The Trees, Thrandeston Road, Brome, Eye (Jan. 1).

Somerset. Coopers Farm Ltd., Marston Magna, Yeovil (Dec. 30).

Surrey. Brookside Farm, Hale, Farnham (Dec. 30); Homewood Farm, Newark Lane, Ripley (Jan. 1).

Warwicks. Piggeries rear of Hawkes Farm Cottage, Heathcote; Lifford Allotments, Lifford Lane, Stirchley, Birmingham (Dec. 30); Piggeries, Croft Farm, Saunders Avenue, Bedworth Nuneaton (Jan. 3).

Yorks. Holly House, Hessay (Dec. 30).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

Muscle Relaxants

Sir,—In your issue of January 4th Mr. P. M. Keen discloses that he is informed that a succinylcholine derivative is soon to be marketed in this country for intravenous use in the horse. He proceeds to condemn this action and even invokes in support of his contention the current correspondence on " the rights of animals."

It is always risky to put on a cap which does not obviously fit, but it is very possible that Mr. Keen was referring to the intention of Messrs. Burroughs Wellcome & Company to issue succinylcholine chloride with specific suggestions for its use, on the advice of the veterinary research workers in The Wellcome Foundation Limited. I therefore feel constrained to reply to Mr. Keen's letter.

From the earliest days of medical interest in muscle relaxants, workers at The Wellcome Research Laboratories—physiologists, pharmacologists, medical clinicians, and veterinary surgeons alike—have been intensely interested in their use and have contributed much to the scientific assessment of their action and application. Included in this group are individuals who have deliberately accepted the injection of muscle relaxants, with and without prior anaesthesia. The physiological and psychological effects of this group of drugs are, then, well known to us.

On many occasions over this long period the application of muscle relaxants in veterinary medicine has been carefully considered. Their usefulness has been observed and small quantities have been supplied to veterinary research workers and clinicians for specific purposes and for further investigation. The possibility that the material might be offered for sale has frequently been reviewed. Until recently we have set our faces firmly against its issue to the profession in the belief that, while it could have a place in veterinary medicine, it was open to unthinking abuse and we should not risk such a happening. Now, however, the extensive Swedish and American experience (C.-H. Hansson (Oct., 1957), *Nord. Vet.-Med.*, **9**, 753) has reviewed the world literature and our own observations on its use for the express purpose of casting the horse has convinced us that we were doing our duty to the animal community in offering the drug* for sale to the profession, with a quite specific recommendation as to its use.

An occasion will arise in the near future when one of my colleagues will recount our work. In these circumstances there is no need for me to go further in this letter than to say that we are entirely satisfied, as have been the others whose work is mentioned above, that there is no undue risk to the patient in this specific use of the drug. Properly applied, and no great level of professional acumen and skill is required in this, succinylcholine chloride can indeed provide the veterinary surgeon in practice with a

* As " Midarine " (B. W. & Co.).

method of avoiding much of the physical risk and mental torture associated with the accepted methods of casting the horse. It can, in fact, provide him with the opportunity to observe further "the rights of animals" by reducing one of the "necessary" sufferings which form part of so many practices designed to the ultimate benefit of the patient.

Mr. Keen quoted Mr. L. W. Hall in support of his contention—which I have clearly understood as a condemnation of those who have advised the issue to the profession of succinylcholine chloride for intravenous use in the horse for casting. I have a great respect for Mr. Hall's work in the field of anaesthetics, but if he has seen succinylcholine chloride used for this particular purpose as extensively as I personally have, I very much doubt if he would join in any criticism.

Yours faithfully,
R. F. MONTGOMERIE.

The Wellcome Research Laboratories,
Beckenham,
Kent.

January 6th, 1958.

Sir,—I should like to endorse very strongly all the points made by Mr. Keen in his letter in THE VETERINARY RECORD of January 4th, and to add my own misgivings about the use of ready-made mixtures of anaesthetic and relaxant now on the market. There have been several reports of human subjects who have been operated on while conscious but paralysed by the action of a relaxant (Winterbottom, 1950). This is a very real danger in veterinary surgery, particularly as the use of relaxants which do not involve artificial respiration, spreads to outlying practices where the veterinary surgeons have neither time nor facilities to acquire an extensive knowledge of the pharmacology of the new drugs.

The Universities Federation for Animal Welfare has been deeply concerned about this problem for some time and has protested to the American workers about the inhumanity of the practice of using relaxant and local anaesthetic. It has now initiated active research on this problem with the object of preventing future abuse of these drugs. The principal dangers and difficulties have recently been reviewed (Croft, 1957) and I should be very pleased to let anyone who is interested have a reprint.

Yours faithfully,
PHYLLIS G. CROFT.

Fairmead,
High Beech,
Loughton,
Essex.

January 6th, 1958.

References

CROFT, P. G. (1957). *M. & B. Vet. Rev.* **8**. 67.
WINTERBOTTOM, E. H. (1950). *Brit. med. J.* i. 247.

Foot-rot in Sheep

Sir,—I fully concur with Mr. G. V. Short's letter (*Vet. Rec.*, December 28th, 1957), in which, referring to the treatment of foot-rot in sheep, he states that "successful control requires the most efficient dressing (in terms of cost/cure) to be available to sheep farmers economically enough to ensure its adequate use."

In my original letter, no comparison of chloromycetin *per se* was made with Cetrimide on this basis, but apropos the observation that "20 per cent. cetyl trimethyl ammonium bromide (Cetrimide) in alcohol . . . is about equal in efficiency to chloromycetin and about one-tenth of the cost," Dr. D. F. Stewart (New South Wales) contends that he "had not found C.T.M.A.B. (Cetrimide) at a concentration of 20 per cent. to be very efficient, in small pen experiments." This finding is amplified by the author of the original article who states that "trials with 20 per cent. C.T.M.A.B. in which 5 sheep with a total of 14 affected feet were treated and then placed in separate pens. Two feet broke down after one week and 5 more broke down after 3 weeks. The high percentage of delayed break-downs was most undesirable."

Surely such criteria as do apply with regard to the treatment of foot-rot, therefore, must inevitably include such factors as the percentage response to the initial application of the medicament on an individual/flock basis, the rate of relapse (if any) to such application, and the cost per head for *repeated* treatment of infected animals. Only when these factors became commensurate with the initial cost of over-all treatment can the product become recognised—and accepted—as being specific.

Yours faithfully,
R. JONES PUGH.
Head of Veterinary Department.

Parke, Davis & Company, Limited,
Staines Road,
Hounslow, Middlesex.

December 30th, 1957.

Circulars Through the Post

Sir,—As he is such a splendid member of the profession I have admired Mr. Hamilton Kirk's work for many a long year, and I was therefore somewhat astounded at his outburst against the Russians who recently used a dog in their latest sputnik experiments. As we do not know what steps were taken to minimise that particular dog's sufferings, sufferings which may not have been as much in vain as certain people think, perhaps it would be best if we kept quiet until more of the facts are known.

But when Mr. Hamilton Kirk objects to circulars coming to him through the post I feel that I must reply if only to educate him on such matters! The money spent on these trade circulars is not wasted. It is a necessary part of one's advertising expenses, and though a number of busy practitioners do as Mr. Hamilton Kirk does—throw them in the waste-paper basket—there are others, less busy perhaps, who take the trouble to see who has sent them, and to what they refer. (I place myself in that capacity too!)

The real point is this. The total amount of money spent on advertising (in all forms) by any one

company forms an extremely small part of one's trading expenses. For example the cost of the *whole* of my own firm's advertisements in the agricultural press, advisory booklets, films, demonstrations, conferences, etc. adds but 2s. 5d. per ton of compound feed sold at an average price of £35 per ton. The reason why the information cannot be sent to practitioners *solely* through THE VETERINARY RECORD, good medium though this is, is probably because (a) it would be more costly, (b) of insufficient space, (c) some busy practitioners are too busy to read the advertisements, and (d) no student of publicity matters puts all his eggs into one basket. Besides what would the Postmaster General do without the income he now receives from the many trade circulars, Christmas cards, etc. posted regularly?

Yours faithfully,
W. P. BLOUNT.

Harkaway,
Risborough Road,
Stoke Mandeville, Bucks.

December 31st, 1957.

Pyometra Complex in the Bitch

Sir,—I hope you will allow me to congratulate Mr. C. Dow on his fine contribution to knowledge of this subject published in your issue of December 14th, 1957. All those concerned must hail it as one of the first importance. In fact Mr. Dow has shown himself to be a worker of such calibre, that he must expect the application of searching standards of criticism to his literary analysis! For I do feel that some inaccuracies here, may mislead the student of comparative endometrial pathology to quite a significant extent.

Mr. Dow states (page 1,414, line 29) that "hyperoestrinism has failed to produce pyometra experimentally in the dog," and again, line 44, "no report of the reproduction of an endometritis exhibiting the clinical and pathological characteristics of pyometra has been published." These statements ignore the results published by Ajello (1948) in which heavy oestrogen administration produced typical pyometra in one of 7 experimental bitches, which died, and similar though less severe histopathological effects in the other 6. If Mr. Dow considers this paper unconvincing, it would have been interesting to have had his reasons. I have personally followed much of Signor Ajello's bovine work and hold it in high respect. Further (page 1,414, line 21), Mr. Dow claims De Vita reported (1939) a "very high" percentage of his cases to be associated with corpora lutea (rather than cysts). Actually the reported percentage with the corpora was less than 50, and in some of the cases cysts also were present. In his paper Mr. Dow does not refer to any later publication by Dr Vita.

It appears to me that Mr. Dow has begun to follow in the footsteps of workers in the human and bovine as well as in the canine field of uterine-hormonal relationships, all of whom assumed a violently partisan attitude on aetiology, while still so far inside the wood that they could see only a few of the trees. Thus, as far as the human species is concerned, one school, exemplified by Mazer, insisted that there cystic glandular hyperplasia was associated with decreased—menopausal—ovarian function and quiescence; this school was quite bitterly at variance with the doctrine supported *inter alia* by Witherspoon, who on quite good grounds claimed ovarian *hyperactivity*, with cyst formation, as the true cause. As Mr. Dow states, there was an established tradition that bitch pyometra was associated solely with cysts and hyperoestrinism; conversely, a comparable tradition existed (*e.g.* Küst, 1932-4; Jaeger, 1934; Kostner, 1939) that cow pyometra was associated solely with retained corpora lutea. It might be thought that the value of such work as De Vita's (1939) was mainly to show that important proportions of bitch pyometra, and purulent endometritis cases were associated both with (retained) corpora lutea and with (oestrogenous) cysts. Similarly it later appeared (Dawson, 1949) that a like variation in ovarian contents applied to bovine purulent endometritis and pyometra cases, 18 of 61 studied in detail yielding only corpora lutea, 13 only cysts, 2 both corpora lutea and cysts, and 28 having small, inactive ovaries. For the human and bovine species, then, the evidence is now that *any* type of departure from a normal rhythmic change of ovarian phase, can result in the endometrial pathology, and Ajello's work, considered alongside Dow's and De Vita's, suggests this may also be true for the canine species. How else can one account for Brancker's report (1952) of good therapeutic results from *progesterone implants* in the bitch condition—contra-indicated on Mr. Dow's findings; while Lebeau's claim (1957), that 25 per cent. of some hundreds of bitches given oestrogens for misalliance, later developed pyometra, seems to buttress Ajello's experimental conclusions, which were based on only 7 subjects. Teunissen's conclusions on only 15 are regarded by Mr. Dow as highly significant. All must, of course, agree that the commonest departure from normal for one species—*e.g.* perhaps anoestrus and ovarian quiescence for the bovine, may be the rarest for another, since Mr. Dow has gone far towards demonstrating that the retained corpus luteum is the most usual content in the associated canine ovaries.

Yours faithfully,
F. L. M. DAWSON.

The White House,
Hadstock,
Nr. Linton,
Cambridgeshire.

December 23rd, 1957.

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A Veterinary Odyssey

Sir,—During the last 12 months my wife and I have had interesting experiences indicative, perhaps, of the romance, if I may use such an unscientific word, which may be associated with the pursuit of our profession. I was on a foreign assignment in Israel at the time of the Suez crisis. Given a few hours' warning to leave we boarded a plane bound for Munich having left practically all our worldly belongings behind. During our short stay in Munich I visited the excellent veterinary school there. I then proceeded to Rome for possible reassignment. There we enjoyed a pleasant stay of 5 months assisting the agricultural attaché on poultry disease control problems.

After Rome I was sent on temporary duty to Ethiopia. This presented a wonderful opportunity for my wife and me to revisit Kenya and Uganda after an absence of 30 years. We returned to the native church in the Eastern Province of Uganda where our daughter had been the first white child to be christened. It was a delightful experience to revisit this wonderful part of Africa after so long.

I was very much impressed by the progress that has been made in Uganda and Kenya, particularly in fields of education, health, and veterinary science. The veterinary school near Nairobi is developing on sound lines.

While looking for an old camping site near Kalait in Uganda where we had spent many weeks, we called to make inquiries at a native village. The man to whom we spoke turned out to be one of a group of very small boys to whom, 30 years ago, I had tried to teach some very elementary soccer. He had subsequently worked in the veterinary department and was now a retired chief with two wives and a pension. He appeared to be doing rather better than his former soccer teacher!

Our return to Israel was uneventful. Those who recall the veterinary laboratories at Haifa and Tel Aviv in the days of the Mandate will be glad to hear that a fine new veterinary laboratory has now been erected at Beit Dagon near Tel Aviv.

May I take this opportunity to send best wishes to colleagues at home.

Yours faithfully,
FRANK H. MANLEY.

144, South Elm Drive,
Beverly Hills,
California,
U.S.A.

December 19th, 1957.

"The Veterinary Record"

Sir,—The last time you changed the cover of THE RECORD, there were one or two comments from your readers, some of them with a *p*H below 7. I must have received about 10 copies of the latest edition, and have noticed no comment on the new cover. In your editorial wisdom, you are doubtless taking this lack of comment as acquiescence, if not tacit approval, so it may interest you to learn that at least two veterinary surgeons approve heartily of the change. I have not had the opportunity to discuss with more than one other.

However, may I make a plea for the return of Mr. Hunting—to the top of the contents page? I would suggest that you do not circumscribe him as formerly, but allow his paternal whiskers a free flow over the paper.

The contents of the journal have also improved. To those of us who try (and often succeed in) controlling epizootics over vast areas, and who find a few hours each week for "general practice," your feature "In Brief" is most useful. The clinical articles have also improved greatly, perhaps as a result of the prize. Again, they keep one in touch.

Perhaps there should be a prize for the writer of a letter to the editor who provokes the greatest number of replies The winner this year is in no doubt!

Some months ago, there was a report of a "Symposium on Clinical Problems." I feel there could be more of this sort of thing. It had never occurred to me, for instance, that sulphadimidine could be administered intraperitoneally. When I think of the wrestling matches I might have been saved, with only an aged farmer for assistance, and a Friesian of 14 cwt. with foul-of-the-foot as a patient, I could kick myself (the cow invariably did!). Why not a prize for the briefest and most useful letter, on the lines of the short reports in the Symposium mentioned?

May I kick the ball off with the following:—

Problem. Tup turned out with the ewes yesterday, now completely lame with foot-rot, and unable to serve.

Answer. A full dose of sulphadimidine 33⅓ per cent. (Sulphamezathine ICI), intravenously (cephalic vein of fore arm, tup in sitting position), and a half dose injected subcutaneously in three or four spots.

Result. Tup back at work next morning.

I record the above because, though I have never seen it reported, I have no doubt that many other practitioners have done likewise, and there may be one or two who would find it a useful piece of information.

Advice on "gadgets" and tackle in general is always useful. I found out the hard way that "long" points are useless for small-animal intravenous work. Looking back, it was rather mean of me not to put it in THE RECORD. I suppose I would have been deterred by the number who knew long before I did! But how silly, there is always a newer boy than oneself!

Yours faithfully,
C. D. COOKE.

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December 23rd, 1957.